What is claimed is:

1. A tungsten-based sintered body consisting of at least either one selected from the group consisting of tungsten, doped tungsten, a tungsten-based material and a tungsten-molybdenum alloy, wherein said doped tungsten consists of tungsten doped with 100 ppm or less (except for zero ppm) of alkali metal, and said tungsten-based material consists of tungsten containing 4 weight% or less (except for zero weight%) of at least one additive selected from the group consisting of oxides of cerium, thorium, lanthanum, yttrium, strontium, calcium, zirconium and hafnium, wherein said tungsten-based sintered body has an isotropic crystal structure, a relative density of 99.5% or more, and an average crystal grain size of 30 μm or less.

2. The tungsten-based sintered body as defined in claim 1, which includes pores each having a major axis of 1 μm or more, wherein the number of the pores is 10000 or less per 1 mm^2 of unit cross-sectional area thereof.

3. The tungsten-based sintered body as defined in claim 1 or 2, which has a hardness difference of 1.0 or less in terms of HRA between a surface portion and an inside portion thereof.

4. The tungsten-based sintered body as defined in either one of claims 1 to 3, which has a recrystallization temperature of at least 1600°C or more.

5. The tungsten-based sintered body as defined in either one of claims 1 to 4, which has a ratio of a minimum value to a maximum value of an electric resistivity of 1.1 or less between any two points therein.

6. The tungsten-based sintered body as defined in either one of claims 1 to 5, which has a ratio of a minimum value to a maximum value of a thermal conductivity of 1.1 or less between any two points therein.

7. A discharge lamp electrode formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

8. A sputtering target formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

9. A crucible formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

10. A radiation shielding member formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

11. A resistance welding electrode formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

12. A semiconductor element mounting substrate formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

13. A structural member formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

14. A switch contact formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

15. A member for semiconductor manufacturing equipment, which is formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

16. A member for an ion-implantation apparatus, which is formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

17. An internal member for a nuclear fusion reactor, which is formed of the tungsten-based sintered body as defined in either one of claims 1 to 6.

18. A method for producing a tungsten-based sintered body, comprising:

subjecting a raw powder having an average particle size of 0.5 to 4 μm to a CIP process at a pressure of 350 MPa or more to form a powder compact, wherein said raw material consists of at least either one selected from the group consisting of: tungsten; doped tungsten consisting of tungsten doped with 100 ppm or less of alkali metal; a material consisting of tungsten containing up to 4 weight% of at least one additive selected from the group consisting of oxides of cerium, thorium, lanthanum, yttrium, strontium, calcium, zirconium and hafnium; and a tungsten-molybdenum alloy;

sintering said powder compact in a hydrogen gas atmosphere at a sintering temperature of 1600°C or more for a holding time of 5 hours or more to form a sintered compact; and

subjecting said sintered compact to a HIP process in an argon gas atmosphere under conditions of 150 MPa or more and 1900°C or more.